

## Laboratory Hazardous Waste Benchtop Treatment

Benchtop treatment is authorized by the State of California for treating laboratory hazardous waste (including hazardous waste that is also radioactive) produced from chemical procedures conducted for the purposes of education, research, chemical analysis, clinical testing, or product development, testing, or quality control.

### *Benchtop treatment requirements:*

- Waste to be treated is a laboratory hazardous or radioactive hazardous waste.
- Treatment is performed using recommended procedures and quantities for treatment of laboratory wastes published by the National Research Council or procedures for treatment of laboratory wastes published in peer-reviewed scientific journals.

**NOTE: For more information see “Management of Waste” in *Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Version*.**

- Treatment is performed in a container.
- Treatment is performed as close as practical to the location where the hazardous waste was generated.
- Individual treatment batches must be from a single procedure, or set of procedures that are part of the same laboratory process.
- Individual treatment batches do not exceed the greater of five gallons or 18 kg OR if less than five gallons or 18 kg, the quantity limits recommended in the procedures published by National Research Council or in other peer reviewed scientific journals.<sup>1</sup>
- Treatment is performed within 10 calendar days of initial waste generation.
- Treatment of radioactive hazardous waste is performed under a Radioactive Work Authorization (RWA).
- Records of training and treatment are maintained and accessible for regulatory inspection for at least three years following the last use of a benchtop treatment procedure.

### *Benchtop treatment training requirements:*

- Personnel performing treatment must have knowledge of the laboratory hazardous waste being treated, including knowledge of the procedure that generated the laboratory hazardous waste, and have completed:
  - EHS 604 “Hazardous Waste Generator Training” and
  - EHS 348 “Chemical Hygiene and Safety Training” (or EHS 353 “Chemical Hygiene and Safety Refresher Training” as appropriate) and
  - EHS 622 “Radioactive and Mixed Waste Generator Training” if waste is radioactive, and
  - On-the-job training to the treatment procedure being performed that includes, at a minimum, how to conduct the treatment, manage the treatment residuals, and respond effectively to emergency situations.

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<sup>1</sup> Some exceptions to these quantity limits are given in the regulations, but not included here.

### *Benchtop treatment waste management requirements:*

- Manage treatment residues in full compliance with federal and state regulations and LBNL policies.
- If allowed discharge nonhazardous, nonradioactive treatment residues to the sanitary sewer system in compliance with written authorization from the Environmental Services Group (ESG).
- If allowed discharge nonhazardous treatment residues containing only very short lived radioisotopes (<14 hour half-life) to the sanitary sewer system in compliance with written authorization from the ESG and in accordance with authorization in the RWA in use.
  - Contact the Radiation Protection Group and see EHS Procedure 708 "Survey of Potentially Contaminated Materials and Equipment for Unrestricted Release," for more information.
- If sanitary sewer discharge is not allowed, requisition treatment residues using the Waste Management Group requisitioning system.
- Adequately characterize the residues for WMG pickup using the processes outlined in PUB-3092.

**NOTE: It is important to be aware that because the wastes are residues from the treatment of a hazardous waste, even if they have been treated to remove the characteristic causing them to be a hazardous waste (e.g. corrosivity or reactivity), additional treatment of the residues after pick up by the WMG may still be necessary.**

- For residues produced in the benchtop treatment of characteristically hazardous corrosive or reactive wastes, identify potential underlying hazardous constituents (UHCs) reasonably expected to be present in the treatment residues using Attachment B.

### **Laboratory Benchtop Treatment Process Steps**

1. Prepare a benchtop treatment procedure (suggested template in [Attachment A](#)).
  - a. Ensure information on how all the requirements given in this document and all the information required on the template is included in the benchtop treatment procedure.
  - b. Identify potential UHCs in the wastes to be treated using the information in [Attachment B](#) and include the information on the potential UHCs and their concentrations in the benchtop treatment procedure.
  - c. Obtain the assistance of a WMG [Generator Assistant](#) to arrange any sampling and analysis necessary to obtain approval to dispose of the treatment residues to the sanitary sewer system.
2. Obtain a RWA for benchtop treatment of radioactive hazardous waste, if not already authorized.
3. As necessary obtain written authorization from the [Environmental Services Group](#) to dispose of the benchtop treatment residues to the sanitary sewer system.
4. As necessary obtain authorization within the RWA for discharge of aqueous treatment residues containing only short lived (<14 hours) radionuclides.

5. Complete on-the-job training on the benchtop treatment procedure for personnel who will be performing the benchtop treatment.
  - a. Ensure all [training records](#) are maintained as specified in the approved benchtop treatment procedure.
6. Prepare for and perform the benchtop treatment in accordance with the approved benchtop treatment procedure and the following requirements.
  - a. Perform the treatment as close as practical to the location where the laboratory hazardous waste is generated.
  - b. If the treatment is being performed to address a safety issue, perform the treatment as soon as possible following generation of the hazardous waste, and prior to placing the waste into an accumulation container.
  - c. For all other hazardous wastes, perform the treatment within 10 calendar days following the date the hazardous waste was first generated.
  - d. Do not exceed the treatment batch limits included in the approved benchtop treatment procedure.
  - e. Complete a [benchtop treatment log](#) during or immediately upon completion of the treatment procedure for each batch of waste treated.
7. Maintain all records produced by the treatment as outlined in the benchtop treatment procedure.
8. Maintain all documentation from the benchtop treatment and waste characterization, as necessary to accumulate and requisition or dispose of the waste.

## Records

Training records for completion of EHS 604 “Hazardous Waste Generator” (record maintained in EHS training system).

Training records for completion of EHS 348 “Chemical Hygiene and Safety” and EHS 353 “Chemical Hygiene and Safety Refresher Training” (records maintained in EHS training system).

Training records for completion of EHS 622 “Radioactive and Mixed Waste Generator Training.”

Training records for on-the-job training to the benchtop treatment procedure (record maintained by division responsible for the benchtop treatment and/or maintained in the EHS training system).

Approved benchtop treatment procedure and completed benchtop treatment log and all associated process knowledge and analytical data used in the hazardous waste determinations for the waste to be treated and waste residues produced (maintained by division responsible for the benchtop treatment)

Written authorization to discharge treatment residues to the sanitary sewer if applicable (maintained by ESG and/or the division responsible for the benchtop treatment).

The RWA authorizing sanitary sewer discharge, if applicable (maintained by Radiation Protection Group).

## References

California Health and Safety Code, Division 20, Chapter 6.5 Hazardous Waste Control, § 25200.3.

California Code of Regulations Title 22, Division 4.5, §66268.48 Table Universal Treatment Standards.

LBNL/PUB-3000, LBNL Environmental Safety and Health Manual, Chapter 20, Waste Management

LBNL/PUB-3092, Waste Management Generator Guidelines and Facilities Guidelines

LBNL EHS Procedure 708 *Survey of Potentially Contaminated Materials and Equipment for Unrestricted Release*, Rev 7, May 23, 2014.

[\*Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Version.\*](#)  
Washington, DC: The National Academies Press, 2011.

## Attachments

Attachment A: Benchtop Treatment Procedure Template, including Training Log and Benchtop Treatment Log.

Attachment B: Guideline for Determining Potential Underlying Hazardous Constituents.

Attachment A

Benchtop Treatment Procedure  
For  
Hazardous Waste and Treatment Description

Revision and Date

Author

Principle Investigator

Submitted by:

[Click here to enter name.](#)

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**Name**

**Date**

Approved by:

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**Signature**

**Date**

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**Signature**

**Date**

## Introduction

Click here enter text.

Discuss the purpose of the benchtop treatment. Briefly describe

- the hazardous waste to be treated,
- where the treatment procedure will be performed (building and lab) and
- the quantity of waste to be treated in each treatment batch.

NOTE This quantity cannot exceed 5 gallons (18.9 liters) of liquid or 39.6 (18 kilograms) of solids OR if less, the quantity limits set forth in the peer reviewed and published work describing the treatment process to be used and referenced in this procedure).

Indicate time lapse between the expected dates of initial generation of a waste batch to be treated and the expected treatment date.

NOTE the time lapse between initial waste generation and treatment cannot exceed 10 calendar days following the date of waste generation.

NOTE For hazardous waste being treated to make it safe for accumulation (e.g. neutralization of concentrated nitric acid solutions) perform treatment as soon as soon after the waste is generated and before it is transferred into a hazardous waste accumulation container.

## Preparation for Treatment

### Waste Description

Click here enter text.

Discuss the hazardous waste to be treated including

- a description of the process (including location) producing the waste,
- the hazardous properties of the waste (e.g., corrosive, reactive),
- the physical properties and form of the waste (e.g. solid, aqueous solution) and
- the waste constituents and concentrations.

Use the following link ([Attachment B](#)) to identify potential underlying hazardous constituents (UHCs) that are reasonably expected to be present in the waste to be treated. Concentration information for each of these identified constituents must be included here. Attach results from any analytical testing performed on the waste to be treated.

### Training

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Discuss here

- 1) who will be authorized to perform the neutralization procedure,
- 2) who is authorized to train them and
- 3) the training required.

NOTE EHS 348 (or EHS 353) and EHS 604 are required. If waste is radioactive, EHS 622 is also required. All personnel authorized to perform the treatment procedure must also have on-the-job training to the bench top treatment procedure.

Use the attached [training log](#) to document completed training to the procedure. Records of the procedure training must be maintained for three years, following the last date of use of the bench top treatment procedure. State the location where these training records will be maintained

## **Waste Disposal**

Click here enter text.

Discuss here how and where treatment residuals will be accumulated or disposed.

- Indicate if the treated waste is to be discharged to the sanitary sewer, or
- requisitioned as a hazardous waste.

NOTE Discharge of hazardous waste into the sanitary sewer system is prohibited.

NOTE Discharge of non-hazardous treatment residues into the sanitary sewer is subject to the East Bay Municipal Unified District (EBMUD) Waste Water Discharge Permit for the facility where the treatment is being performed. Written authorization to discharge any treatment residues to the sanitary sewer must be obtained from the [EHS Environmental Service Group \(ESG\)](#) prior to performing bench top treatment.

NOTE If treatment residues have been approved by ESG for sanitary sewer discharge and contain only very short lived radioisotopes (<14 hours half-life) approval to discharge the liquids to the sanitary sewer must also be authorized by the Radiological Work Authorization (RWA) in use. Contact the [Radiation Protection Group](#) for more information.

Treatment residues that cannot be discharged to the sanitary sewer will be managed through the Waste Management Group.

## **Precautions, Equipment and Supplies**

### **Precautions**

Click here enter text.

Discuss any precautions that must be observed when working with the hazardous wastes to be treated and other treatment reagents and equipment. Address environmental factors that should be considered (e.g., other work processes in the area).

### **Equipment and Supplies**

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List all equipment to be used in the process and all personal protective equipment to be used.

### **Containment**

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Discuss here the primary container in which the waste will be treated and the secondary containment to be used. Discuss how you will prevent an overflow of the treatment container during the process. This could include a limitation on the volume of liquid waste in the primary container to ensure adequate secondary containment in the event of an overflow or spill.

## Treatment Procedure

Click here enter text.

Include the treatment procedure steps here.

NOTE To treat hazardous waste using a bench top treatment the treatment procedure must be published in a peer-reviewed scientific journal.

Use that published material as basis for the treatment procedure described here. Discuss the step-by-step procedure for the treatment including

- the setup,
- the reagents to be used,
- the rate of reagent addition,
- precautions to be observed,
- emergency response, and
- data to be recorded in the treatment log.

The benchtop treatment must be documented using the attached [treatment log](#) (modified as needed).

## Applicable Documents

Click here enter text.

List applicable documents here. At a minimum this will include the bench top treatment procedure training log, the treatment log, the sanitary sewer discharge authorization (if applicable), and the authorization by RPG (when applicable).

## References

Click here enter text.

List the references used in preparation of this procedure. At a minimum the source of the treatment procedure outlined in this procedure must be referenced here



# Benchtop Treatment Log

Waste Description:

Benchtop Treatment Procedure Name, Revision/Date:

[illegible]

# On-the-job Training Log - Personnel Authorized to Perform this Procedure

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**Procedure Name:**

**Revision and Date:**

The following personnel have received on-the-job training in benchtop treatment of the hazardous waste to be treated under procedure referenced above. Training includes

- 4) how the waste was generated,
- 5) documentation and characterization of waste and how to fill out the treatment log
- 6) safety precautions
- 7) treatment procedure
- 8) accumulation and disposal of the waste
- 9) emergency response.

Name	Signature	Training date	Employee Number

Training records must be maintained for three years following final use of this procedure.

## Attachment B

### Guideline for Determining Potential Underlying Hazardous Constituents

For almost all characteristically hazardous RCRA wastes the regulatory treatment standards include the requirement to treat the waste not only to remove the characteristic hazard (e.g. corrosivity or reactivity) but to treat underlying hazardous constituents (UHCs) in the wastes. UHCs are those contaminants that, at the point of generation, are reasonably expected to be present in concentrations above constituent specific concentrations specified in the regulations. UHCs are shown in the Underlying Hazardous Constituent Table below. If you generate a reactive or corrosive characteristic hazardous waste, when you either

- requisition the waste for pick up or
- prepare a benchtop treatment procedure to treat the waste in the laboratory,

you must identify all potential UHCs you reasonably expect to be present in the waste and the known or expected concentration of each. Typically this information will be known through your process knowledge and sampling and analysis of the waste will not be required to determine potential UHCs.

For hazardous waste requisitioned for pick-up all of the potential UHCs identified, as well as all other constituents in the waste, must be included on the requisition along with information on expected or known concentrations.

For hazardous waste to be treated using a benchtop treatment procedure, all of the potential UHCs identified, as well as all other constituents in the waste, must be included on the benchtop treatment procedure along with information on expected or known concentrations. Benchtop treatment of wastes that are corrosive or reactive may result in treatment residues that are no longer corrosive or reactive (i.e. are non-hazardous waste) but which still contain UHCs.

All non-hazardous, benchtop treated wastes not going for disposal in the sanitary sewer system in compliance with written authorization from the Environmental Services Group, will require requisitioning using the electronic hazardous waste requisition system.

When requisitioning benchtop treatment residues it is important that generators include on the requisition

- Estimated or known concentrations in the treatment residues of all of the potential UHCs identified for the waste that was treated,
- Estimated or known concentrations in the treatment residues of any constituents added by the treatment process, and
- Estimated or known concentrations of any other constituents in the treatment residues.

The Waste Management Group needs this information to evaluate if any additional treatments are required for the treatment residues prior to consolidation with other waste or disposal. Use the table below to determine what constituents in your characteristically hazardous waste are potential UHCs.

The table indicates which constituents are potentially UHCs for wastewaters and nonwastewaters. Wastewaters are defined in the regulations as wastes that contain less than one percent by weight total organic carbon (TOC) and less than one percent by weight total suspended solids (TSS). Nonwastewaters are wastes that do not meet the criteria for wastewaters.

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
<b>Inorganic Constituents</b>			
Antimony	7440-36-0	Yes	Yes
Arsenic	7440-38-2	Yes	Yes
Barium	7440-39-3	Yes	Yes
Beryllium	7440-41-7	Yes	Yes
Cadmium	7440-43-9	Yes	Yes
Chromium (Total)	7440-47-3	Yes	Yes
Cyanides (Total)	57-12-5	Yes	Yes
Cyanides (Amenable) <sup>4</sup>	57-12-5	Yes	Yes
Fluoride <sup>5</sup>	16984-48-8	Yes	No
Lead	7439-92-1	Yes	Yes
Mercury - Nonwastewater from Retort	7439-97-6	No	Yes
Mercury - All Others	7439-97-6	Yes	Yes
Nickel	7440-02-0	Yes	Yes
Selenium	7782-49-2	Yes	Yes
Silver	7440-22-4	Yes	Yes
Sulfide	18496-25-8	Yes	No
Thallium	7440-28-0	Yes	Yes
Vanadium	7440-62-2	Yes	Yes
Zinc	7440-66-6	Yes	Yes
<b>Organic Constituents</b>			
Acenaphthylene	208-96-8	Yes	Yes
Acenaphthene	83-32-9	Yes	Yes
Acetone	67-64-1	Yes	Yes
Acetonitrile	75-05-8	Yes	Yes
Acetophenone	96-86-2	Yes	Yes
2-Acetylaminofluorene	53-96-3	Yes	Yes
Acrolein	107-02-8	Yes	No
Acrylamide	79-06-1	Yes	Yes
Acrylonitrile	107-13-1	Yes	Yes
Aldrin	309-00-2	Yes	Yes
4-Aminobiphenyl	92-67-1	Yes	No
Aniline	62-53-3	Yes	Yes
Anthracene	120-12-7	Yes	Yes
Aramite	140-57-8	Yes	No

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
alpha-BHC	319-84-6	Yes	Yes
beta-BHC	319-85-7	Yes	Yes
delta-BHC	319-86-8	Yes	Yes
gamma-BHC	58-89-9	Yes	Yes
Benzene	71-43-2	Yes	Yes
Benz(a)anthracene	56-55-3	Yes	Yes
Benzal chloride	98-87-3	Yes	Yes
Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	Yes	Yes
Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	Yes	Yes
Benzo(g,h,i)perylene	191-24-2	Yes	Yes
Benzo(a)pyrene	50-32-8	Yes	Yes
Bromodichloromethane	75-27-4	Yes	Yes
Bromomethane/Methyl bromide	74-83-9	Yes	Yes
4-Bromophenyl phenyl ether	101-55-3	Yes	Yes
n-Butyl alcohol	71-36-3	Yes	Yes
Butyl benzyl phthalate	85-68-7	Yes	Yes
2-sec-Butyl-4,6-dinitrophenol-Dinoseb	88-85-7	Yes	Yes
Carbon disulfide	75-15-0	Yes	Yes
Carbon tetrachloride	56-23-5	Yes	Yes
Chlordane (alpha and gamma isomers)	57-74-9	Yes	Yes
p-Chloroaniline	106-47-8	Yes	Yes
Chlorobenzene	108-90-7	Yes	Yes
Chlorobenzilate	510-15-6	Yes	No
2-Chloro-1,3-butadiene	126-99-8	Yes	Yes
Chlorodibromomethane	124-48-1	Yes	Yes
Chloroethane	75-00-3	Yes	Yes
bis (2-Chloroethoxy) methane	111-91-1	Yes	Yes
bis (2-Chloroethyl) ether	111-44-4	Yes	Yes
Chloroform	67-66-3	Yes	Yes
bis (2-Chloroisopropyl) ether	39638-32-9	Yes	Yes
p-Chloro-m-cresol	59-50-7	Yes	Yes
2-Chloroethyl vinyl ether	110-75-8	Yes	No
Chloromethane/Methyl chloride	74-87-3	Yes	Yes
2-Chloronaphthalene	91-58-7	Yes	Yes
2-Chlorophenol	95-57-8	Yes	Yes
3-Chloropropylene	107-05-1	Yes	Yes
Chrysene	218-01-9	Yes	Yes

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
o-Cresol	95-48-7	Yes	Yes
m-Cresol (difficult to distinguish from p-cresol)	108-39-4	Yes	Yes
p-Cresol (difficult to distinguish from m-cresol)	106-44-5	Yes	Yes
Cyclohexanone	108-94-1	Yes	Yes
o,p'-DDD	53-19-0	Yes	Yes
p,p'-DDD	72-54-8	Yes	Yes
o,p'-DDE	3424-82-6	Yes	Yes
p,p'-DDE	72-55-9	Yes	Yes
o,p'-DDT	789-02-6	Yes	Yes
p,p'-DDT	50-29-3	Yes	Yes
Dibenz (a,h) anthracene	53-70-3	Yes	Yes
Dibenz (a,e) pyrene	192-65-4	Yes	No
1,2-Dibromo-3-chloropropane	96-12-8	Yes	Yes
1,2-Dibromoethane/Ethylene dibromide	106-93-4	Yes	Yes
Dibromomethane	74-95-3	Yes	Yes
m-Dichlorobenzene	541-73-1	Yes	Yes
o-Dichlorobenzene	95-50-1	Yes	Yes
p-Dichlorobenzene	106-46-7	Yes	Yes
Dichlorodifluoromethane	75-71-8	Yes	Yes
1,1-Dichloroethane	75-34-3	Yes	Yes
1,2-Dichloroethane	107-06-2	Yes	Yes
1,1-Dichloroethylene	75-35-4	Yes	Yes
trans-1,2-Dichloroethylene	156-60-5	Yes	Yes
2,4-Dichlorophenol	120-83-2	Yes	Yes
2,6-Dichlorophenol	87-65-0	Yes	Yes
2,4-Dichlorophenoxyacetic acid/2,4-D	94-75-7	Yes	Yes
1,2-Dichloropropane	78-87-5	Yes	Yes
cis-1,3-Dichloropropylene	10061-01-5	Yes	Yes
trans-1,3-Dichloropropylene	10061-02-6	Yes	Yes
Dieldrin	60-57-1	Yes	Yes
Diethyl phthalate	84-66-2	Yes	Yes
p-Dimethylaminoazobenzene	60-11-7	Yes	No
2-4-Dimethyl phenol	105-67-9	Yes	Yes
Dimethyl phthalate	131-11-3	Yes	Yes
Di-n-butyl phthalate	84-74-2	Yes	Yes
1,4-Dinitrobenzene	100-25-4	Yes	Yes
4,6-Dinitro-o-cresol	534-52-1	Yes	Yes
2,4-Dinitrophenol	51-28-5	Yes	Yes

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
2,4-Dinitrotoluene	121-14-2	Yes	Yes
2,6-Dinitrotoluene	606-20-2	Yes	Yes
Di-n-octyl phthalate	117-84-0	Yes	Yes
Di-n-propylnitrosamine	621-64-7	Yes	Yes
1,4-Dioxane	123-91-1	Yes	Yes
Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	Yes	Yes
Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	Yes	Yes
1,2-Diphenylhydrazine	122-66-7	Yes	No
Disulfoton	298-04-4	Yes	Yes
Endosulfan I	959-98-8	Yes	Yes
Endosulfan II	33213-65-9	Yes	Yes
Endosulfan sulfate	1031-07-8	Yes	Yes
Endrin	72-20-8	Yes	Yes
Endrin aldehyde	7421-93-4	Yes	Yes
Ethyl acetate	141-78-6	Yes	Yes
Ethyl benzene	100-41-4	Yes	Yes
Ethyl cyanide/Propanenitrile	107-12-0	Yes	Yes
Ethyl ether	60-29-7	Yes	Yes
bis (2-Ethylhexyl) phthalate	117-81-7	Yes	Yes
Ethyl methacrylate	97-63-2	Yes	Yes
Ethylene oxide	75-21-8	Yes	No
Famphur	52-85-7	Yes	Yes
Fluoranthene	206-44-0	Yes	Yes
Fluorene	86-73-7	Yes	Yes
Heptachlor	76-44-8	Yes	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	35822-46-9	Yes	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	67562-39-4	Yes	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	55673-89-7	Yes	Yes
Heptachlor epoxide	1024-57-3	Yes	Yes
Hexachlorobenzene	118-74-1	Yes	Yes
Hexachlorobutadiene	87-68-3	Yes	Yes
Hexachlorocyclopentadiene	77-47-4	Yes	Yes
HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	Yes	Yes
HxCDFs (All Hexachlorodibenzofurans)	NA	Yes	Yes

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
Hexachloroethane	67-72-1	Yes	Yes
Hexachloropropylene	1888-71-7	Yes	Yes
Indeno (1,2,3-c,d) pyrene	193-39-5	Yes	Yes
Iodomethane	74-88-4	Yes	Yes
Isobutyl alcohol	78-83-1	Yes	Yes
Isodrin	465-73-6	Yes	Yes
Isosafrole	120-58-1	Yes	Yes
Kepone	143-50-0	Yes	Yes
Methacrylonitrile	126-98-7	Yes	Yes
Methanol	67-56-1	Yes	Yes
Methapyrilene	91-80-5	Yes	Yes
Methoxychlor	72-43-5	Yes	Yes
3-Methylcholanthrene	56-49-5	Yes	Yes
4,4-Methylene bis(2-chloroaniline)	101-14-4	Yes	Yes
Methylene chloride	75-09-2	Yes	Yes
Methyl ethyl ketone	78-93-3	Yes	Yes
Methyl isobutyl ketone	108-10-1	Yes	Yes
Methyl methacrylate	80-62-6	Yes	Yes
Methyl methansulfonate	66-27-3	Yes	No
Methyl parathion	298-00-0	Yes	Yes
Naphthalene	91-20-3	Yes	Yes
2-Naphthylamine	91-59-8	Yes	No
o-Nitroaniline	88-74-4	Yes	Yes
p-Nitroaniline	100-01-6	Yes	Yes
Nitrobenzene	98-95-3	Yes	Yes
5-Nitro-o-toluidine	99-55-8	Yes	Yes
o-Nitrophenol	88-75-5	Yes	Yes
p-Nitrophenol	100-02-7	Yes	Yes
N-Nitrosodiethylamine	55-18-5	Yes	Yes
N-Nitrosodimethylamine	62-75-9	Yes	Yes
N-Nitroso-di-n-butylamine	924-16-3	Yes	Yes
N-Nitrosomethylethylamine	10595-95-6	Yes	Yes
N-Nitrosomorpholine	59-89-2	Yes	Yes
N-Nitrosopiperidine	100-75-4	Yes	Yes
N-Nitrosopyrrolidine	930-55-2	Yes	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	Yes	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	Yes	Yes
Parathion	56-38-2	Yes	Yes



		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3	Yes	Yes
Pentachlorobenzene	608-93-5	Yes	Yes
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	Yes	Yes
PeCDFs (All Pentachlorodibenzofurans)	NA	Yes	Yes
Pentachloroethane	76-01-7	Yes	Yes
Pentachloronitrobenzene	82-68-8	Yes	Yes
Pentachlorophenol	87-86-5	Yes	Yes
Phenacetin	62-44-2	Yes	Yes
Phenanthrene	85-01-8	Yes	Yes
Phenol	108-95-2	Yes	Yes
Phorate	298-02-2	Yes	Yes
Phthalic acid	100-21-0	Yes	Yes
Phthalic anhydride	85-44-9	Yes	Yes
Pronamide	23950-58-5	Yes	Yes
Pyrene	129-00-0	Yes	Yes
Pyridine	110-86-1	Yes	Yes
Safrole	94-59-7	Yes	Yes
Silvex/2,4,5-TP	93-72-1	Yes	Yes
1,2,4,5-Tetrachlorobenzene	95-94-3	Yes	Yes
TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	Yes	Yes
TCDFs (All Tetrachlorodibenzofurans)	NA	Yes	Yes
1,1,1,2-Tetrachloroethane	630-20-6	Yes	Yes
1,1,2,2-Tetrachloroethane	79-34-5	Yes	Yes
Tetrachloroethylene	127-18-4	Yes	Yes
2,3,4,6-Tetrachlorophenol	58-90-2	Yes	Yes
Toluene	108-88-3	Yes	Yes
Toxaphene	8001-35-2	Yes	Yes
Tribromomethane/Bromoform	75-25-2	Yes	Yes
1,2,4-Trichlorobenzene	120-82-1	Yes	Yes
1,1,1-Trichloroethane	71-55-6	Yes	Yes
1,1,2-Trichloroethane	79-00-5	Yes	Yes
Trichloroethylene	79-01-6	Yes	Yes
Trichloromonofluoromethane	75-69-4	Yes	Yes
2,4,5-Trichlorophenol	95-95-4	Yes	Yes
2,4,6-Trichlorophenol	88-06-2	Yes	Yes
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93-76-5	Yes	Yes
1,2,3-Trichloropropane	96-18-4	Yes	Yes
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	Yes	Yes
tris- (2,3-Dibromopropyl) phosphate	126-72-7	Yes	Yes

		Potential Underlying Hazardous Constituent?	
REGULATED CONSTITUENT	CAS Number	Wastewater	Nonwastewater
Vinyl chloride	75-01-4	Yes	Yes
Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	Yes	Yes

Attachment B References:

California Code of Regulation, Title 22, Division 4.5, Chapter 18, Article 4, 66268.48 Universal Treatment Standards

LBNL/PUB-3000, Berkeley Lab Environmental Safety and Health Manual, Chapter 20, Waste Management.

LBNL/PUB-3092, Waste Management Generator Guidelines and Facilities Guidelines.